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THE STALLION AND FERTILITY

The Technique of Sperm Collection and Insemination

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Introduction

The importance of the stallion in maintaining a high fertility record is well recognised by those engaged in work on horse breeding; it has been shown that between maximum fertility and sterility, there are stallions of all degrees of fertility.

Since ovulation occurs towards the end of a long oestrous period in the mare, spermatozoa must be capable of survival for a considerable length of time when fertilisation results from service early in oestrus. It is, therefore, probable that in any individual stallion the longevity of the sperm in the reproductive tract of the mare largely determines the level of his fertility. With the development of artificial insemination, an improved technique has been evolved for collecting sperm from stallions by means of an artificial vagina (Walton, 1938).

During the last three years an investigation has been made in which samples of sperm have been collected from 26 stallions.

Some stallions were only collected from once or twice, and in many of them the fertility record was not known, but five stallions with good records and from which a number of collections of sperm were made, offer sufficient material to be of guidance to veterinary surgeons in trying to assess the probable fertility of stallions from an examination of sperm.

Technique for Collection of Sperm and Artificial Insemination in Horses

Apparatus required

(1) An artificial vagina, Cambridge pattern, consisting of a metal cylinder, with rubber sleeve inside, and a sperm collecting bottle fitted at the tapered end.

Fig. 1.—Cambridge pattern Artificial Vagina. B is the collecting bottle; F is the metal cap.

(2) A small flat glass bowl into which semen may be poured for separation of the sperm from accessory secretions.

(3) A thermometer.

(4) A suitable syringe for insemination. This may consist of an all-glass 10 or 20 c.c. syringe with long tapered end, which fits in a protective metal holder, or an ordinary all-glass 10 c.c. syringe with a vulcanite nozzle, may be used.

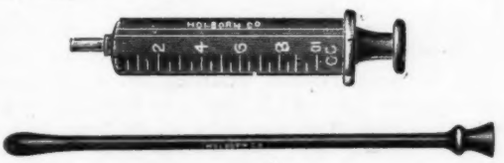

Fig. 2.—Syringes for Inseminating.

(5) A vaginal speculum, either the plain, tubular type or the Polansky model.

Fig. 3.—Tubular vaginal speculum.

(6) A microscope with 2/3 and 1/6 objectives for direct examination of sperm after collection.

(7) Glass slides, coverslips, pipettes made from drawn out glass tubing, and rubber teats to fit them. The pipettes are used to draw up small quantities of sperm for preparing slides for microscopic examination.

(8) White vaseline, liquid paraffin, alcohol and normal saline.

Care of Apparatus

The rubber sleeve in the artificial vagina must always be cleaned by immersing in a boiling 2 per cent. solution of washing soda for about 15 minutes. It is then thoroughly rinsed with warm water, dried with a cloth and wiped over with 65 per cent. alcohol and allowed to dry in a dust free cupboard or drawer.

Glassware is washed with warm water and soda, rinsed thoroughly, wiped with alcohol and allowed to dry.

Inseminating syringes are washed with cold water and then alcohol and allowed to dry. Before use they are rinsed out with distilled water and then normal saline.

PREPARATION OF ARTIFICIAL VAGINA

The rubber sleeve is turned inside out, and laid on a clean towel and then smeared liberally with white vaseline. It is then turned right side out again and rubbed between the hands to ensure even distribution of the vaseline.

After this it is inserted into the metal cylinder of the artificial vagina and the narrow neck of the sleeve is turned back over the casing and bound in position with tape or soft string.

The collecting bottle is gently pushed into the neck and held in position by screwing on the metal cap. The artificial vagina is then held with the metal cap on the ground and the large opening upturned. Holding the upper end of the sleeve the space between the rubber and the metal container is filled with water heated to 50° C. This warms the whole apparatus in a few minutes. About one-third or one-half of the water is then poured away, according to the size of the stallion's penis, and the large end of the rubber sleeve is turned back over the metal cylinder and bound with soft string.

The apparatus is then ready for use, and should be watertight, with an internal temperature of about 45° C.

The pressure in the artificial vagina may then be tested by placing the forearm with clenched fist into it. For a thoroughbred stallion, an even pressure should then be felt. It is better to have the pressure slightly too great than too slack as stallions appear to be more vigorous with greater pressure. For heavy draught stallions, the closed fist should be able to be inserted without much pressure being felt.

The mare should now be secured in the normal way for covering, a groom at her head, service hobbles on, and when necessary, a twitch.

The stallion is led up to the mare in the normal way, and allowed to mount. The man in charge of the stallion is instructed to stand well forward as the horse mounts.

Two men are required to hold the artificial vagina. Both should stand on the near side. One man holds the artificial vagina in his left hand and guides the horse's penis in with his right hand. The other man holds the upper end of the artificial vagina so that it is held at an angle of 45°.

When the stallion ejaculates the peristaltic waves of the urethra can be felt at the base of the penis by the first man with his right hand. After this he instructs the second man to lower his end of the artificial vagina and as the stallion's penis relaxes and the horse prepares to dismount the two men retire with the artificial vagina, bottle downwards.

The collecting bottle is then taken off, and the sperm poured into the flat glass bowl into which a little liquid paraffin has been added. The coating of paraffin prevents exposure to the air.

The ejaculate will vary from 50 to 200 c.c. or more and has a whitish opaque appearance. It consists of two portions, the sperm-serum, a watery fluid containing the sperm and giving the opaque appearance, and a thick, sticky, glairy secretion which comes from the seminal vesicles and does not contain sperm. The sperm-serum is ejaculated first and the vesicular fluid last. This vesicular fluid will block the inseminating syringe, so as quickly as possible the two portions are separated. This is done by tipping the bowl until the semen nearly runs over the edge, and picking out the vesicular fluid with the thermometer and allowing it to run over the edge into another vessel.

The inseminating syringe is then prepared and a minimum of 10 c.c. of the sperm-serum inseminated into the mare. To do this, stand the mare with her quarters to the light. Insert the speculum and pass the inseminator through the cervix. If difficulty is encountered in getting the nozzle of the inseminator

(*a*) (*b*)

FIG. 4. (*a*) Ejaculation is taking place into the artificial vagina; (*b*) the stallion is preparing to dismount. Note the position taken up by grooms, and those manipulating the artificial vagina.

TABLE I.

Date.	Total volume of ejaculate c.c.	Volume of sperm c.c.	Volume of vesicular fluid c.c.	Density of sperm serum (Millions/c.c.) after separation from vesicular fluid.	Total number of sperm (millions).	Motility at time of collection.	Time since previous service.	Service behaviour.	Remarks.
STALLION A. *Age—about 20 years. Half-bred pony 14·2 hands*									
6.6.39	187	44	143	118	5,192	80% good	2 years	Vigorous	
8.6.39	172	78	94	123	9,594	80% „	2 days	„	
10.6.39	160	90	70	112	10,080	80% „	2 „	„	
14.6.39	195	115	80	91	10,465	50% fair	4 „	„	
21.6.39	132	132	0	128	16,898	60% „	7 „	„	
29.6.39	202	102	100	119	12,138	80% good	8 „	„	
30.6.39	108	68	40	108	7,344	90% „	1 day	„	
4.7.39	153	103	50	130	13,390	80% „	4 days	„	
7.7.39	181	147	34	104	15,288	80% „	3 „	„	
8.7.39	110	88	22	111	9,768	80% „	1 „	„	Blood in sperm. Had tried rectal massage of vas 2 hours earlier
10.7.39	66	66	0	136	8,976	80% „	2 „	„	Blood in sperm
12.7.39	78	78	0	131	10,218	80% „	2 „	„	„ „
14.7.39	67	67	0	128	8,576	80% „	2 „	„	„ „
22.7.39	46	46	0	146	6,716	80% „	8 „	„	
11.8.39	50	50	0	224	11,200	80% „	20 „	„	

STALLION B. *Date of birth*, 1926. *Thoroughbred.*

Years at stud ...	1931	1932	1933	1934	1935	1936	1937	1938
Number of mares	31	38	39	43	14	20	6	7
Per cent. Fertility	74%	82%	72%	67%	93%	65%	66%	57%

2.6.37	116	116	0	233	27,028	90% good	5 days	Vigorous	
4.6.37	93	90	3	100	9,000	90% „	2 „	„	
7.6.37	95	89	6	170	15,130	90% „	3 „	„	Large quantity of seminal fluid probably resulted from horse mounting mare 5 minutes prior to collection
18.2.38	62	58	4	168	9,744	80% „	Prev. year	„	
23.2.38	75	57	18	140	8,980	80% „	3 days	„	
7.3.38	170	64	106	90	5,760	90% „	2 „	„	
18.3.38	90	68	22	126	8,568	80% „	2 „	„	
21.3.38	96	68	28	138	9,384	100% „	2 „	„	
1.4.38	100	42	58	129	5,418	80% „	1 day	„	
3.4.38	34	34	0	112	3,808	80% „	2 days	„	
7.4.38	70	70	0	114	7,980	80% „	2 „	„	
13.4.38	107	63	44	185	11,655	90% „	2 „	„	
15.4.38	79	52	27	113	5,876	90% „	2 „	„	
18.4.38	63	63	0	123	7,749	80% „	1 day	„	
8.5.38	120	70	50	132	9,240	80% „	1 „	„	
10.5.38	94	64	30	120	7,680	80% „	2 days	„	
11.5.38	40	40	0	128	5,120	80% „	1 day	„	
13.5.38	40	32	8	150	4,800	80% „	1 „	„	Some sperm spilt
14.5.38	59	36	23	181	6,516	90% „	1 „	„	
16.5.38	54	46	8	136	6,256	90% „	18 hours	„	
18.5.38	51	51	0	118	6,018	80% „	1 day	„	
13.4.39	18	18	0	130	2,340	80% „	2 days	„	Most sperm spilt
5.5.39	86	86	0	71	6,006	100% „	1 week	„	
6.5.39	69	62	7	102	6,324	90% „	1 day	„	

STALLION C. *Date of birth*, 1927. *Thoroughbred.*

Years at stud ...	1932	1933	1934	1935	1936	1937	1938
Number of mares	11	11	11	16	8	8	6
Per cent. Fertility	73%	64%	73%	56%	88%	88%	33%

5.3.38	70	70	0	196	13,720	90% good	2 days	Vigorous
16.3.38	65	65	0	98	6,370	80% „	2 „	„
7.4.38	42	42	0	133	5,586	80% „	18 hours	„
11.4.38	28	28	0	86	2,408	80% „	18 „	„
13.4.38	73	73	0	68	4,964	80% „	1 day	„
16.4.38	56	56	0	118	6,608	80% „	6 hours	„
18.4.38	58	58	0	111	6,438	80% „	2 days	„
11.5.38	78	78	0	147	11,466	60% „	2 „	„
13.5.38	80	80	0	76	6,080	80% „	1 day	„
13.5.38	32	32	0	106	3,392	80% „	6 hours	„
17.5.38	61	61	0	73	4,453	80% „	1 day	„
17.5.38	52	52	0	89	4,628	80% „	5 hours	„
19.5.38	87	87	0	77	6,699	80% „	1 day	„
21.5.38	62	62	0	121	7,502	80% „	2 days	„
23.5.38	86	86	0	118	10,148	80% „	2 „	„
6.6.38	101	101	0	107	10,807	80% „	1 day	„

TABLE I (*Contd.*)

Date.	Total volume of ejaculate c.c.	Volume of sperm c.c.	Volume of vesicular fluid c.c.	Density of sperm serum (Millions/c.c.) after separation from vesicular fluid.	Total number of sperm (millions).	Motility at time of collection.	Time since previous service.	Service behaviour.	Remarks.
				STALLION D. *Date of birth*, 1928. *Thoroughbred.*					
				Years at stud ... 1933	1934	1935	1936	1937	1938
				Number of mares ... 21	42	44	45	43	42
				Per cent. Fertility ... 84%	76%	70%	75%	63%	74%
3.3.38	84	64	20	34	2,176	90% good	5½ hours	Vigorous	
14.4.38	79	42	37	150	6,300	90% „	6 „	„	
16.5.38	50	38	12	157	5,966	90% „	1 day	„	
17.6.39	76	42	34	113	4,746	90% „	3 days	„	
				STALLION E. *Date of birth*, 1931. *Thoroughbred.*					
				Years at stud ...	1936	1937	1938		
				Number of mares	21	38	43		
				Per cent. Fertility	62%	63%	63%		
7.3.38	74	62	12	27	1,674	60% good	18 hours	Vigorous	
11.3.38	50	50	0	22	1,100	80% „	5 „	„	
28.3.38	30	30	0	34	1,020	60% fair	18 „	„	
3.4.38	35	35	0	25	875	70% „	18 „	„	
5.4.38	61	37	24	39	1,443	80% good	18 „	„	
22.4.38	68	48	20	37	1,776	80% „	18 „	„	
24.4.38	33	33	0	25	825	60% fair	18 „	„	Some sperm spilt
3.5.38	55	23	32	42	966	80% good	6 „	„	
11.5.38	88	40	48	43	1,720	60% fair	18 „	„	
12.5.38	52	12	40	38	456	70% good	18 „	„	
13.5.38	52	52	0	50	2,600	80% „	18 „	„	
14.5.38	71	43	28	48	2,064	70% „	18 „	„	
15.5.38	111	32	79	47	1,504	80% „	24 „	„	
25.5.38	105	65	40	54	3,510	80% „	18 „	„	
3.6.38	105	68	37	45	3,260	80% „	24 „	„	
5.6.38	98	73	25	47	3,431	80% „	18 „	„	
8.6.38	81	53	28	51	2,703	80% „	24 „	„	
13.6.38	126	52	74	53	2,756	80% „	6 „	„	
15.6.38	137	72	65	64	4,608	80% „	2 days	„	
20.5.39	52	34	18	27	918	70% „	18 hours	„	
2.6.39	96	52	44	37	1,924	70% „	18 „	„	
5.6.39	65	17	48	20	340	60% „	6 „	„	

through the cervix, gently rotate it from side to side.

When only one mare has to be inseminated, good results have been obtained by using 30 c.c. of sperm-serum. If several mares are to be inseminated the sperm should be divided equally amongst them.

Insemination is not a cure-all for sterility, it merely provides economy in the use of stallions, and in sperm from stallions, and ensures that a definite amount of sperm is placed in the uterus free from any dilution or contamination from vaginal secretions, although in cases of straining after service, or where there is any abnormality of the cervix, artificial insemination has often been successful when natural mating had failed to get mares in foal.

Since mares stay in oestrus anything from two to 14 days and normally about seven days, to ensure that virile sperm are present at the time of ovulation, it is advisable to inseminate at three-day intervals after the first insemination until the mare goes " off."

Transport of horse semen is only practical when the interval between collection and insemination is not longer than 4 to 6 hours. For this purpose the sperm should be protected with paraffin and slowly cooled to 10° C. and prior to use it should be left at room temperature for 10 minutes.

EXPERIMENTAL MATERIAL AND METHODS

The results of an investigation of the details of stallion spermatozoa, and an indication of the breeding histories of a number of stallions are given in the accompanying tables. Four stallions were thoroughbreds and one a half-bred pony. Stallion A, the pony, was used in 1939 to mate with seven pony mares (Day, 1940) and all of these became pregnant. The fertility record of stallion B must be judged on the years 1931-1936, as in 1937 and 1938 he only had a few mares with bad breeding histories. Stallion C must be judged on the years 1932-1937 as in 1938 he only had a few mares with bad histories. Stallions D and E can be judged on records of 1933-1938 and 1936-1938 respectively. No records of foalings are available for season 1939. The feeding and management of all these stallions was particularly good and did not vary from year to year. Collections were made with the Cambridge pattern artificial vagina as described by Walton (1938).

After collection the semen was separated into the two parts, and the volumes of each measured. The motility was estimated by looking at a thin smear of the sperm-serum under the 2/3 and 1/6 objectives of a microscope. This method, although the only one applicable under practical conditions, is not very good, as it was found that on cold, windy days the sudden cooling of the sperm on the glass slide slowed up the activity of the spermatozoa.

The density of the sperm was estimated by diluting 1 c.c. of the sperm-serum with 99 c.c. of saline, and sperm counts were made with a haemocytometer.

Results.

The results of the collections are given in Table I, showing the yearly fertility, age and breed of stallions, the interval prior to service and remarks on service behaviour.

In Table II the average total number of spermatozoa have been taken and these are compared with the average fertility records of the stallions, based on the years already mentioned.

Table II

Designation of stallion.	Number of mares covered.	Number pregnant.	Per cent. Fertility of stallion.	Average total number of spermatozoa in ejaculate (millions).
			Per cent.	
A	7	7	100	10,383
B	185	141	76	8,182
C	65	48	74	6,954
D	237	175	74	4,797
E	102	64	63	1,871

Stallion A, which was only mated with seven mares, all of which became pregnant, is not necessarily the stallion of highest fertility.

The only deduction one can make from this table is that stallions A, B, C and D are all stallions of high fertility, and in these stallions the average total number of spermatozoa in an ejaculate was between 4,000 and 10,000 millions. Stallion E, with an average of approximately 2,000 million spermatozoa in an ejaculate, although having a fairly good fertility record, was not as good as the other stallions, and it may be that as the total number of spermatozoa fall below the 2,000 million, the fertility of a stallion will gradually decline ; but it must be borne in mind that in these stallions, service intervals varied from six hours to two days or more ; when more frequent services are made both volume and density of ejaculate will be lower. It is interesting to note that stallion A was used on pony mares to determine the time of mating in oestrus which gave the best fertility results, and it is shown that two out of three mares became pregnant when insemination was carried out 72 hours prior to ovulation. This meant that the spermatozoa from this stallion could live 72 hours in the reproductive tract of the mare, and probably some hours more than that, as fertility was not low after this interval.

From Table I it can be seen that one collection of sperm is not sufficient to condemn a horse as of low fertility but may be sufficient to pronounce him of good fertility.

The interval between services did not affect the quantity or density of the sperm in those horses where the interval in most cases varied between 6 hours and a week.

In other horses which were making more frequent services, five and six times a day, a much lower density was noticed, although the volume was good. Collections from horses where the interval was less than one hour, usually resulted in lower density and lower volume.

Only two completely sterile horses have been examined and in both of them all spermatozoa were dead. In other horses of low fertility, it was usually found that both the density and volume were very low, density about 10 to 15 million per c.c., and volume 10 to 25 c.c. In one stallion both density and volume were good and his low fertility was thought to be due to his very unruly behaviour at service. Stained smears have been made of the sperm collected from all stallions, but very few abnormal spermatozoa have been seen.

It is of interest to note that in stallion C, all stained smears showed a high proportion of spermatozoa with a protoplasmic bead on the tail which looks like a collar just below the head. Also, this stallion showed a larger number of double-headed sperms than any others. Percentage counts of these types of sperm from stallion C, showed that there were 35 to 45 per cent. of sperms with the bead and 4 to 6 per cent. of double-headed ones. As the stallion had good fertility results, it appears probable that as long as there are good numbers of normal, motile sperms, the presence of a small percentage of abnormal sperms is unlikely to have any material bearing on fertility.

The most variable factor concerned in the examination of these stallions has been the quantity of vesicular fluid in the ejaculate. Stallion C never gave any, the other stallions gave all volumes from 0 to 200 c.c., usually 50 to 100 c.c. The amount of vesicular fluid could not be correlated with any one definite factor, and it would be interesting to know on what the secretion of this fluid depends. It does not appear to exert any determining effect on fertility.

With stallion A, rectal massage of the vasa deferentia was tried on July 8th, 1939, without result, and it is interesting to note that afterwards he failed to give any vesicular fluid, and there was blood present in the sperm for a week afterwards.

Summary

(1) With vigorous stallions, the collection of sperm by means of an artificial vagina was simply carried out and only one horse failed to ejaculate. Several lethargic horses would not ejaculate.

(2) When collection was unsuccessful there was no deleterious effect on the stallion concerned.

(3) Fertility of stallions was good when the total number of spermatozoa in ejaculate was 4,000 to 10,000 millions, the sperms were active, and the interval between services varied from six hours to a week. Fertility appeared to decline when total numbers of sperm fell below 2,000 millions with the same service intervals.

(4) Fertility appeared to depend on the total number of active sperms ; relatively small numbers of abnormal sperms had no bearing on fertility.

(5) The amount of vesicular fluid in any ejaculate was very variable, its presence seemed of no importance but it would be interesting to know the cause of this great variation.

(6) It is known that the sperm from one stallion could live in the reproductive tract of the mare for 72 hours, and as two mares became pregnant out of three mated at this interval prior to ovulation, it is probable that it can live some time longer.

(7) One collection of sperm may be sufficient to pronounce a stallion of good fertility, but several collections should be made before condemning a horse as of low fertility.

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LOCAL USE OF VITAMIN A IN OPHTHALMIC CONDITIONS

"A review of the use of vitamin A for superficial defects of the eyes by Dr. Stephen de Grósz of Budapest[1] is of interest in connection with the recent correspondence in our columns on the treatment of gas injuries of the eyes. The author finds that the local application of vitamin A is of greater significance in the field of ophthalmology than is oral or intramuscular administration. He notes that it has always been the custom among laymen in Hungary to apply milk and butter to the eye for the treatment of various ocular diseases irrespective of their aetiology; this may be looked upon as local vitamin therapy, and so, again, may the mysterious cure of Tobias's disease (serpent ulcer?), which was effected by the local application of fish liver, though some authors claimed that the cure resulted from the destruction of pneumococci by bile salts. The local application of vitamin A was first undertaken by Russian observers. Later, cod-liver oil was employed by Lohr for trophic conditions; E. Stephenson in England drew attention to its use in keratitis due to mustard gas; Federici held that it was more effective than synthetic remedies. De Grósz, using a preparation containing 1,000 international units of vitamin A in one centimetre of oil or ointment, finds it of great value in promoting epithelisation of fresh corneal lesions—for example, erosions after the extraction of foreign bodies; it has also a powerful analgesic effect. For wounds of the eyelids the ointment is employed. The oily preparation has a good effect on injuries and burns of the conjunctiva, for after thorough rinsing of the cul-de-sac its application prevents adhesions by hastening epithelisation of the conjunctiva. Because of its analgesic and lubricating effect it is invaluable for injuries from gases used in industry and in warfare. In his experience the most important indication for local treatment with vitamin A is in the herpetic forms of corneal disease. In these cases the epithelium is loosened by the first movement in the morning and torn off with great pain, which can be prevented by instilling vitamin A oil at night. He notes an excellent example of this in a case of alcoholisation of the Gasserian ganglion with subsequent severe keratitis. De Grósz concludes that vitamin A as a local remedy not only helps epithelisation but is truly a protective agent for the epithelium."—*British Medical Journal.*

(1) *Arch. Ophthal.* (1939.) 22. 727.

CLINICAL COMMUNICATION

Ulcerative Stomatitis of Camels

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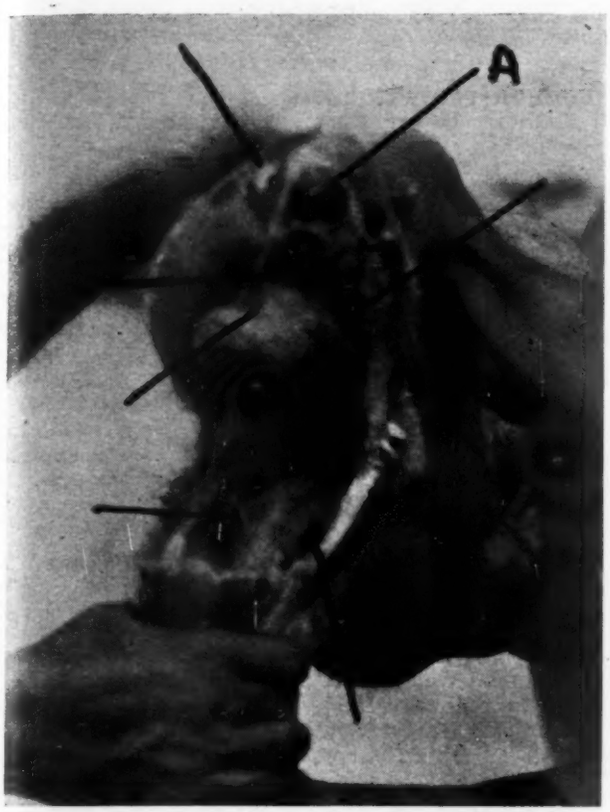
The following condition is an uncommon one in Somali camels, and presumably it must be rare in other countries as Leese does not mention it in his "One-Humped Camel." I have seen three cases in five years, and as many Somalis have never seen a case this must be considered an unusually large number. The condition appears to be resistant to ordinary treatment.

Subject.—A ten-year-old pregnant female in good condition. It was stated by the owner that the camel had been suffering from the disease for several years.

Lesions.—The lesions occurred only on the inside of the lips, cheeks and on the dorsum and sides of the tongue. They were very shallow circular, or oval, brick-red ulcers of about the size of a two-shilling piece. A small amount of yellowish semi-viscid discharge exuded from the surface, and at the periphery was a slightly raised rim of hardened brown scar tissue, while in the centre of some of the lesions a cornified tag some 0·5 cm. in length was observed which somewhat resembled a buccal papilla. That these were not true papillae is shown by the fact that they were seen under the relatively smooth, upper lip where no such papillae normally occur. In some cases these tags appeared to be hollow. The surface

Lines direct to position of ulcers.



Each line on the photographs points to an ulcer, and that one which is marked A is showing a central yellow " tag " of tissue.

of the ulcer showed no tendency to haemorrhage and was not especially sensitive.

Examination of Patient.—The patient was negative to Bennett's test for trypanosomiasis, and scrapings from the surface of the ulcer after roughly drying it with a swab showed no marked characteristics and singularly few bacteria. However, material from under the scar tissue at the periphery of the ulcer showed a profusion of bacteria and some spirochaetes.

The owner said that feeding the camel on the roots of an unidentified tree called locally " Fara Dera " brought about a partial cure which was subsequently followed by relapse. These roots it was affirmed are " hot," and so are probably astringent. In passing, it is of interest to note that it is reliably asserted that the roots of this tree are capable of supplying a camel with his sole source of water throughout the dry season.

A popular superstition is that syphilis can be contracted from the bite of a camel, and I wonder if the ulcers now described have given rise to this legend.

The recording of this case is prompted by the hope that those more experienced may record their observations of this pathological condition.

At the annual meeting of the Shetland Pony Stud Book Society a suggestion made by Mr. J. E. Kerr, who was reappointed president, that all the present office-bearers and officials should remain in office until the end of the war, with power to carry on the business of the society, was approved.

ABSTRACTS

[THE TROPICAL GRASS *MELINIS MINUTIFLORA* AS A PREVENTIVE AGAINST MALARIA AND OTHER TROPICAL DISEASES. Morgan, E. (1940.) *J. Trop. Med. and Hyg.*, July. 179.]

One of the potentially richest agricultural countries in the world, with an area equal to that of France, Britain and Holland combined, Venezuela now supports a human population of less than four million. Disease vectors, such as mosquitoes and ticks, as well as snakes abound, and malaria renders the interior of the country uninhabitable. During the last ten years it has been found that land planted for cattle fodder with a coarse grass commonly known as *gordura* or *capim melado* (*Melinis minutiflora*) becomes almost free of mosquitoes and snakes when the grass is in its green stage and cattle covered with ticks entering such areas are cleared of these parasites after a few weeks' stay. The grass is rich in protein and is extensively planted in Venezuela and Colombia for fattening animals ; it is rather coarse for sheep. It has a penetrating and pleasant odour. Its destructive action on vermin is probably caused by the oily substance secreted on the surface of the leaves. The seeds are small and slender, and when the planted areas are in flower about November they resemble fields of Yorkshire fog. The grass unfortunately does not grow well on swampy ground. It grows luxuriantly on arid soil, even on anthills. It must be protected against camp fires, for it burns with intensity and is slow to recuperate. After cleaning the land, seeds are sown on the surface, about 8 lb. to the acre, and must not be covered with soil. Although generally used for pasturage it can yield heavy crops suitable for cutting as fodder.

During the last few years, the Venezuelan Government has encouraged immigration from Denmark and elsewhere by forming colonies of population in different districts and the system has been adopted of planting the grass around dwelling houses as a preventive against the above-mentioned pests.

J. T. E.

[We have learned from Messrs. Sutton of Reading that in 1928 they conducted in this country, on a single sample of seeds sent them, trials of this grass in the open ground, which failed ; under glass they succeeded in flowering a few plants, which did not form mature seed. It will be understood (say Messrs. Sutton) that better results might be obtained with other seed raised under glass.]

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[AVIAN TUBERCLE BACILLI IN THE TONSILS OF SWINE. Feldman, W. H., and Karlson, A. G. (1940.) *J. Amer. vet. med. Ass.* **96**. 146-148.]

One tonsil from each of 94 swine carcases was examined by bacteriological and histological methods. In 42 cases the contiguous lymphatic nodes were affected with tuberculosis whilst lesions of tuberculosis were not observed in the other 42 carcases. Twenty-two strains of *M. tuberculosis* were obtained all of which were of the avian type. Fourteen of these were obtained from carcases in which there was gross tuberculosis and eight where there were no gross lesions. Typical histological lesions of tuberculosis were not observed in any of the tonsils, although suggestive

lesions occurred in four of them. Nearly all the tonsils contained morbid lesions of greater or lesser degree; in some of them there were purulent areas containing organisms resembling *Actinomyces bovis*.

J. F.

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[PARA-AMINOPHENYLSULPHAMIDE (1162 F) IN THE CHEMOTHERAPY OF *STR. EQUI* INFECTIONS. (Trans. title.) Descazeaux, J., Courtade, R., and Rocq. (1939.) *Bull. Acad. vét. France.* **12.** No. 7.]

Experiments on a rather small number of mice showed that 0·005 gramme of 1162 F twice daily gave protection against many lethal doses of *Str. equi* or delayed death in the case of larger numbers of streptococci.

Eight cases of strangles were treated by the administration of 1162 F in an electuary, the recommended dose being 0·1 gramme per kilo. The animals were dosed once a day and treatment was maintained for six days. The best results were obtained in the septicaemic forms of the disease before there was any localisation. The temperature dropped quickly and recovery was rapid.

In the early stage of intrathoracic localisation, 1162 F. appeared of some value, but when pneumonia had developed treatment with 1162 F. did not help.

D. M.

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[PURULENT ARTHRITIS IN A FOAL DUE TO *SALMONELLA TYPHI-MURIUM* VAR. *COPENHAGEN* (STORRS). Henning and Clark. (1938.) *J. S. Afr. vet. med. Ass.* **9.** 179-181.]

A three weeks' old foal developed large swellings, first in the near stifle, then in both knees, the off elbow and the near shoulder. The swellings fluctuated and pus was evacuated. The condition of the animal gradually retrogressed, and it died after an illness of three weeks' duration.

An organism of the *Salmonella* group was isolated from the pus which by agglutination and absorption tests could be regarded as a IV variant of *S. typhi-murium*. Similar organisms have previously been isolated from man, pigeons and rabbits, but not from horses.

A. W. T.

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[THE SENECIO ALKALOIDS. I.—THE ISOLATION OF ISATIDINE FROM *SENECIO RETRORSUS* AND *SENECIO ISATIDEUS*. De Waal, M. L. (1939.) *Onderstepoort J.* **12.** 155.]

In contrast with previous findings the alkaloid isatidine has now been isolated from *Senecio retrorsus* as well as from *S. isatideus*, which also contains subsidiary amounts of retrorsine, found in quantity in *S. retrorsus*. These two species of the genus *Senecio* are poisonous plants occurring widely in South Africa, and are responsible for deaths accompanied by cirrhosis of the liver in sheep, cattle and horses. Descriptions are given of the chemical and physical properties of isatidine and of one product of its hydrolysis, isatinicic acid. Procedures for the hydrolysis of isatidine to isatinicic acid and of oxidation to oxalic acid are also given in detail.

A. E.

REPORT

[UGANDA PROTECTORATE. (1940.) Report of the Veterinary Department for the Year ended December 31st, 1939. (Simmons, R. J.) pp. 23. 5 tables.]

For reasons of economy this report has been abridged. It contains the report of the Director of Veterinary Services, the report of the Senior Veterinary Research Officer and a second brief report on Veterinary Education by the same officer in his capacity as Dean of the Veterinary School.

The Director of Veterinary Services reports that in spite of low cotton prices and consequently lower stock values, interest in stock markets was maintained. They are most successful in those areas which are well provided with transport facilities—these will be improved as and when possible. Breeding experiments are being undertaken to improve the type of stock for slaughter.

Disease Control.—Rinderpest was widespread throughout the year, first in Mubende and Toro Districts in the west of the Protectorate, then in Samia County on the Kenya border and finally in Karamoja. Game infection complicated the situation in the west and drought in Karamoja. Control was by vaccination and, where indicated, double inoculation. Regarding other diseases, the position remains much the same as in previous years.

Anti-Tsetse Operations—Fly Surveys, etc.—The policy of attacking tsetse fly concentrations has now been abandoned in favour of one of defence as it was found that the methods previously employed merely dispersed the fly. Work was confined to restricting the spread and investigating new "fly" areas. Recent investigation has shown that the Maruzi fly belt in Lango District is extending northwards and north-eastwards and trypanosomiasis is becoming more common.

Animal Husbandry.—All the stock farms but one seem to have been closed down or to have passed into the hands of the Agricultural Department. At the remaining one at Mbarara in the Western Province breeding and grazing experiments will be conducted. The closing down of Koja Stock Farm is recorded, but no mention is made of the fate of Sukulu Stock Farm in the Eastern Province which it is presumed has also been closed. Pasture conditions, disease and breed vary much throughout the Protectorate, and at least one stock farm in the Eastern Province would appear to be necessary; that circumstances should lead to the curtailment of these activities which form such a large part of the work of many other Veterinary Departments, cannot but be regarded with regret. Legislation for the control of the hides and skins trade was enacted. A perusal of the livestock returns reveals the fact that Karamoja, a district in which little work has hitherto been possible, carries the largest stock population of over 1,000,000 head.

Veterinary Laboratory.—The Senior Veterinary Research Officer reports that staff difficulties greatly hindered research. The stock paddocks continue to be expanded. Soil analysis shows that there is a calcium deficiency; this is a common finding in sandy soils in England. Mixed grazing with donkeys greatly improved the grasses. Numerous observations are being made and it has already been established that at Entebbe 1 to 1·5 acres per beast will keep

native cattle in good condition in a normal year. Rinderpest vaccine and serum continue to be produced; the former is now standardised to contain 3·3 grammes of spleen pulp to each 10 c.c. Experiments with goat virus have also been undertaken. A mixed infection of *T. vivax* and *T. uniforme* in a sitatunga is recorded. A blood analysis revealed a low calcium content in some suspected cases of mineral deficiency. Several cases of rickettsia infection in dogs were successfully treated with soluseptasine. The comparative resistance of various breeds to injections with virulent bovine tubercle cultures is being studied. A helminthological survey is being made of normal animals by means of egg counts and *post-mortem* examinations; those helminths encountered are recorded.

R. F.

IN PARLIAMENT

The following are among the questions and answers recorded in the House of Commons recently:—

Control of Horses in Evacuated Areas During Enemy Attack

Mr. Rostron Duckworth asked the Home Secretary whether it is proposed to issue any order dealing with the control of horses in evacuated areas during enemy attack?

Sir J. Anderson: General instructions on this matter have already been given to Regional Commissioners, who will consult with the military and local authorities; but the detailed measures to be taken must depend on the circumstances at the time.

Sir R. Gower asked the Home Secretary whether, having regard to the circumstances that drivers are asked to stand by their horses in roads and streets during air raids, he will consider the desirability of making it compulsory that all such drivers shall be supplied with steel helmets?

Sir J. Anderson: The precautions which drivers are asked to take for the safety of their horses do not necessarily imply that they must stand by their animals during a raid. In any event the present demands for steel helmets for essential war services is such that it would not be practicable to allow them to be made available as my hon. Friend suggests.

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Undesignated Milk

Mr. David Adams asked the Parliamentary Secretary to the Ministry of Food what steps are being taken to render fit for human consumption undesignated milk now being supplied for food by the Milk Marketing Board; and whether, pending such remedial action, he will prohibit the sale of this product in the interests of public health?

Mr. Boothby: During the past six years the percentage of undesignated milk has fallen from 95 to 52 of the total quantity of milk produced. Every effort is being made by the Milk Marketing Board, with the financial assistance of the Government, to increase the production of designated milk. In addition, a proportion of undesignated milk is pasteurised before sale for liquid consumption. The proportion varies in different parts of the country. It would not be practicable to prohibit the sale of undesignated milk, since the supply of designated milk is not yet sufficient to meet the requirements of the liquid consumer.

Mr. Adams: Is the Minister aware that certain authorities are warning people against the use of this undesignated milk? Would it not be better for the Ministry to purify it before putting it on the market?

Mr. Boothby: The best we can do is to take every practicable step to secure the purification of milk.

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Poultry Feeding Stuffs

Mr. Glenvil Hall asked the Parliamentary Secretary to the Ministry of Food what steps he is taking to increase the supply of feeding stuffs for poultry, in view of the fact that there is now a great shortage of eggs coupled with the need to keep down their import to the lowest possible level?

Mr. Boothby: Feeding stuffs are being imported so far as shipping is available. The Government have decided that priority of supplies must be given to cattle and sheep, and poultry keepers have been warned by my right hon. Friend the Minister of Agriculture and the Secretary of State for Scotland, that their supplies of purchased feeding stuffs may have to be reduced to one-third of their pre-war requirements by October. In view of the shortage of eggs, I cannot accept the suggestion that it is necessary to restrict their import to the lowest possible level.

Mr. Hall: Would it not be better to import feeding stuffs for poultry rather than eggs? If the space is there, why not use it for feeding stuffs?

Mr. Boothby: As I said, we are importing the maximum possible amount of feeding stuffs.

Mr. W. Roberts: Are we to understand that the reduction mentioned in the answer refers to one-third of the pre-war poultry stocks?

Mr. Boothby: Yes, Sir.

Mr. Mathers: What is the percentage of the reduction in feeding stuffs in respect of sheep and cattle, as compared with that for poultry?

Mr. Boothby: I should like notice of that Question.

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Agriculture (Credit Facilities)

Mr. Craven-Ellis asked the Chancellor of the Exchequer whether consideration will be given to the formation of an agricultural discount bank whose chief business would be to make 80 per cent. advances to farmers on the security of nine months commercial bills guaranteed by the Government, to enable farmers to finance their crops, such bills to be discounted at a rate not exceeding 2 per cent.

The Parliamentary Secretary to the Ministry of Agriculture (Mr. T. Williams): I have been asked to reply. The answer is in the negative.

Mr. Craven-Ellis: May I ask why it is that agriculturists cannot get some assistance in carrying out the Government programme to provide more food? Is it not unfair to expect the joint stock banks to give further facilities, having regard to the decay which has taken place in this industry?

Mr. Williams: The proposal of my hon. Friend would involve a very large indirect subsidy to farmers' credits, which at the moment is not necessary and has not been called for by the National Farmers' Union.

Mr. Granville: Is the hon. Gentleman completely satisfied with the present system of extending credits to farmers?

Mr. Williams: I am not completely satisfied with anything.

Mr. De la Bere: Is it not a fact that no real assistance is intended? Why not be honest about it?

At a later session Mr. De la Bere asked the Prime Minister whether, in collaboration with the Chancellor of the Exchequer and the Minister of Agriculture, he will convene a meeting of the principal bankers throughout the country with a view to the creation of an agricultural credit bank?

The Lord Privy Seal (Mr. Attlee): No, Sir. In view of the credit facilities which are already available to farmers, I think such a proposal is unnecessary.

Mr. De la Bere: Does my right hon. Friend not realise that this matter cannot be lightly dismissed, indeed

that it cannot be dismissed at all? Someone must initiate a beginning, and will not my right hon. Friend "Go to it"?

Mr. Wilfrid Roberts: Has the right hon. Gentleman satisfied himself that there is not a widespread demand among farmers for credit facilities?

Mr. Attlee: According to my information, there are already sufficient facilities.

Mr. De la Bere: Are there not 500,000 borrowers who want these credits? Why not do in the national interest what 500,000 people want?

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Highland Cattle

Mr. Robert Gibson asked the Secretary of State for Scotland whether he will cause a census of Highland cattle in the Lowlands of Scotland to be made forthwith, with a view to their immediate transfer to former actual, and still potential, grazing land in and outside deer forests, but presently infested with bracken?

The Secretary of State for Scotland (Mr. Ernest Brown): I do not consider that the suggested census would serve any useful purpose, for an indiscriminate transfer of the kind suggested would not be practicable or in the interests of food production.

Mr. Gibson: Is the Minister aware that Highland cattle in the Lowlands of Scotland have been placed there for ornamental purposes, and that if they were transferred to the deer forests, they would work their passage through life by bringing the bracken under control?

Mr. Brown: I am not aware of that. The number of Highland cattle in the Lowlands of Scotland is relatively small, and such Highland cattle as are there are on rough grazing, for which they are suitable.

Mr. Gibson: When the right hon. Gentleman says that the number is relatively small, what does he mean in numbers?

Mr. Brown: I have not any figures available, but my information is that the number is relatively small.

Mr. Hannah: Cannot somebody invent a beast that will eat the bracken?

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Experiments on Living Animals (Return)

Mr. Groves asked the Home Secretary when the Annual Return of Experiments on Living Animals for the past year will be presented?

Sir J. Anderson: This is one of the publications of which the issue must in present circumstances be subordinated to other claims, and I am not at present in a position to say when the return will be published.

PREVENTION OF WASTE OF FOOD

The Waste of Food Order, 1940, which came into force in mid-August, is primarily intended to serve as a general warning against waste. It is hoped that the fact that the Minister of Food has taken these powers will prove a sufficient deterrent and that it will not be necessary to undertake numerous prosecutions.

"Waste" is not confined to certain particular acts or conduct mentioned in the Order, but includes any act or conduct which constitutes waste in the opinion of a competent court.

Food Control Committees will be informed that it was not the Minister's intention to render the keeping of animals impossible when the use of human food for this purpose is reasonably necessary. They will be advised that prosecutions connected with the keeping of animals might well be confined to cases where, in their judgment, human food has been used wastefully, either because the quantity used was excessive or because other food stuffs, not suitable for human consumption, might have been substituted.

NOTES AND NEWS

The Editor will be glad to receive items of professional interest for inclusion in these columns.

Diary of Events

Sept. 2nd.—Meeting of the Editorial Committee, N.V.M.A., at 36, Gordon Square, W.C.1, 4 p.m.

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National A.R.P. for Animals Committee

Reserve Petrol Ration

Since our last announcement, in our issue of August 10th, Mr. W. T. Rowlands, M.R.C.V.S., D.V.S.M., Veterinary Investigation Officer, University College of North Wales, Bangor, has been appointed N.A.R.P.A.C. Liaison Petroleum Officer for the North Wales area comprising the counties of Anglesey, Caernarvon, Merioneth, Montgomery, Denbigh and Flint.

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PERSONAL

It is with particular pleasure that we record that the Committee of Management of the *Journal of the Royal Army Veterinary Corps* has awarded to Dr. J. T. Edwards—who has, both as contributor and member, rendered valued assistance to our own Editorial Committee for many years—the Sir Frederick Smith Memorial Medal for his contribution "Carotene (or Vitamin A) Deficiency and Some Common Unsoundnesses in Horses." This medal is awarded for contributions of outstanding merit.

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Marriages.—Hudson—Day.—On August 10th, 1940, at All Saints' Church, Newmarket, by the Rev. Canon T. R. Browne (vicar), Mr. Edward Walter Hudson, M.R.C.V.S., of Kettering, son of Mr. E. A. Hudson, veterinary surgeon, and Mrs. Hudson, of Barrow, and Miss Flossie E. Day, daughter of Mr. Reginald Day, trainer, and Mrs. Day, of Terrace House, Newmarket. Mr. F. E. Day, F.R.C.V.S., brother of the bride, was best man, and many people well known in the racing world were present at the service and reception. Mr. Trevor Spencer, of Kettering, and Mr. Hudson are partners.

Simpson—Ebsworth.—The marriage between James N. Simpson, B.Sc., M.R.C.V.S., and Joan Margaret, younger daughter of Mr. and Mrs. D. L. Ebsworth, Beach Hotel, Pendine, took place by licence at Pendine Parish Church on Saturday, August 10th, 1940.

Wilson—Vickers.—On August 14th at St. Peter's Church, Syston, Leicester, William Leveny Wilson, M.R.C.V.S., only son of the late Mr. G. Wilson and of Mrs. Wilson of Tain, Ross-shire, to Frances Isaline, eldest daughter of the late Mr. and Mrs. Vickers of Tilton, Leics.

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Will.—Miss Agnes Rawden Fawkener, of Holloway, N., who left £6,840, after two bequests of £1,000 each, and certain other bequests of a smaller character left "all her other property to the Royal Veterinary College, to assist in the upkeep of the hospital and the work of alleviating the sufferings of the sick and suffering animals, particularly those belonging to persons who through financial circumstances are unable to pay the usual fees for professional services to their animals."

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R.C.V.S. OBITUARY

Cornell, Robert Leslie, B.Sc. (Lond.), 1949, Wireless Road, Bangkok, Thailand. Graduated London, July 13th, 1922. Died August 4th, 1940.

The passing of Mr. R. L. Cornell will be a grief to the wide circle of his friends in the profession, for he was a valued research worker and of unassuming and endearing character. He served his profession most usefully at

home and abroad and the sadly premature termination of his career in comparatively early life is a great loss. An appreciation of Mr. Cornell will appear in our next issue.

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UNIVERSITY OF LONDON EXAMINATIONS IN VETERINARY SCIENCE

The following is the Pass List (July, 1940) for the Examinations in Veterinary Science held by the University of London:—

Second Examination in Veterinary Science (Part II).—Arnold, Roger Malcolm; Brain, Peter Gordon Parma; Evans, Esaiah Thomas Rees; Macgregor, Douglas Esdaile, and Smith, Gordon John Edward—all of the Royal Veterinary College, London.

B.Sc. (Veterinary Science) Examination.—Kyaw, Maung Hla; Salmon, Stella Margery—both of the Royal Veterinary College.

The following passed in one of the two parts of the examination: *Part I.*—Beament, Robert Alfred Arthur; Ticehurst, Robert Edward—both of the Royal Veterinary College.

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HORSED UNITS IN THE ARMY

"The horse has not entirely passed beyond the ken of the British Army," writes a special correspondent to the *Times* (from the Northern Command) in a recent issue. "It is common knowledge (he continues) that many mounted regiments have been sent out to the Middle East, but since the outbreak of war several horse batteries and training units have been formed in this country, and, with the German example in mind, there may be more in the future.

"After seeing so much of the all-powerful petrol motor during my tour of the North it was rather refreshing to come down to the hunting country and visit the last remaining remount depôt. The stable yards, surrounded by their rich grasslands, were full of a measured activity that somehow set off the rolling landscape, yet one could not miss the wistful note in the colonel's voice when he spoke of the piping times of peace when all the cavalry was horsed. With the development of motorisation many cavalrymen have felt the existence of an unnecessary prejudice against the horse. In their view there is room for the two in the manifold tasks of a modern army, and the ability of cavalry to get across open country might be the quickest counter to enemy landings from the air in the heart of rural districts. There must be many areas where local hunts might form the nucleus of a mounted Home Guard. There will probably be little fox-hunting this year; the hunt for parachutists could be a grim substitute.

"One of the criticisms of the French Army most often heard is that it was not sufficiently motorised, yet it was their experience on manoeuvres that in bad weather the horse could cross country inaccessible to motor-cyclists and light armoured cars. Perhaps the most spirited action of the French attack early in the war was fought by a regiment of Chasseurs, who advanced mounted into the mine-infested Warndt Forest and reached the outer works of the German West Wall. The French retained several mounted divisions, and during the period of border skirmishes horsed scouts were frequently playing their normal rôle of reconnaissance in the hills and woods of no-man's-land. It was undoubtedly a sign of weakness that I should encounter so many horse-drawn transports, though during the cruel winter in Lorraine many of these columns were getting through where motors broke down—but so far Hitler has fought a fair-weather war.

"The remount depot, which is responsible for the purchase and issue of all the army's requirements, is by no means idle. There are still several hundred horses in the establishment, which has handled some thousands since the beginning of the war, when a bigger remounting programme was envisaged than has actually been carried out. Apart from the cavalry, well over 1,000 chargers being used by infantry and artillery officers were returned to the depot when war broke out.

"All the horses I saw, from handsome chargers to sturdy troop, draught, and pack horses, were in splendid fettle. One of them, a great thoroughbred, had carried Field-Marshal Sir Edmund Ironside, and, they said, been made to look like a pony. Some, past winners at many a point-to-point meeting, were being taken over the jumps, the colonel himself at their head, while others in the paddocks were being schooled and exercised. A visit to the sick-bays under a veterinary officer of long experience gave one an insight into the extraordinary care that is taken of ill and wounded horses."

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LEGAL NOTES

Thomas Shorrock, Derby Farm, Weeton, was summoned at Kirkham Police Court recently for possessing a cow suffering from tuberculosis of the udder and failing to give notice to the police. He pleaded not guilty. It was stated that the right hindquarter of the udder was enlarged and indurated. The condition was reportable. The defendant said he had no idea that the cow was suffering from tuberculosis. He thought the cow had mastitis and had not sold any of its milk. Shorrock was fined £1 and ordered to pay one guinea veterinary officer's fee.

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At Sussex Assizes a Westham farmer was awarded damages of £85, with costs, against the Southern Railway Co., the value of a pedigree bay gelding horse which, it was alleged, had died from exhaustion after becoming entangled in a wire fence separating a field from the railway line.

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SULPHANILAMIDE IN WAR-TIME SURGERY

"The uses of the sulphanilamide group of drugs are still creating interest in the national Press," states the *Pharmaceutical Journal* of August 17th, which continues: "This week the medical correspondent of *The Times* referred to the new treatment of wounds by the implantation of sulphanilamide, and also to the destruction of staphylococci by a new preparation in this group. The treatment of wounds was described by L. Colebrook in a letter to *The Lancet*, July 27th. In brief, sulphonamide is blown into the wound from a hand pump and simultaneously the drug is administered orally.

"In the British Army the wounds of a number of injured have been packed in this manner after débridement and have shown successful results. French wounded were also treated by this method as well as by having the drug before débridement, and the results were stated to be encouraging. The use of sulphanilamide emulsion is also under investigation, and French surgeons have achieved successful results with sulphonamide "crayons" inserted into small wounds; in such treatment the drug is absorbed slowly and is in contact with the wound over a long period. A variation in the method of applying sulphanilamide to wounded tissues is described on page 52.

"According to the writer in *The Times*, a new preparation (designated so far by a serial number) 'attacks staphylococci wherever they are to be found.' This sweeping generalisation is, presumably, a reference to sulphathiazole, otherwise M and B 760, or 'Thiazamide,' of which the properties and therapeutic achievements have already been described in *The Journal* (June 29th, 1940, p. 375). If this presumption is correct the statement quoted cannot in our present state of knowledge be

completely substantiated, though further results are being reported almost daily in American medical literature."

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GOVERNMENT'S SYSTEM OF LIVESTOCK PRIORITIES

A poultry keeper who addressed a letter to Lord Woolton, the Minister of Food, on the subject of home-produced eggs, received the following reply (states *The Times*):—

"The food value of eggs and their importance in the dietary of the people are fully appreciated, but the question has to be considered in relation to the serious shortage of imported feeding stuffs and the requirements of other classes of livestock. The Government, after very careful consideration, have laid down a system of livestock priorities. It was decided that preference should be given first to the requirements of dairy cattle owing to the paramount importance of maintaining the milk supply, and then to fat cattle and sheep over pigs and poultry. In reaching this decision the Government had regard to the fact that our herds of cattle are an important national asset, and that if they were seriously depleted it would take years to replenish them. Pigs and poultry, on the other hand, can be more quickly restored.' In addition, pigs and poultry are more dependent on imported cereals for their upkeep, and they compete more directly with man for their food than do cattle and sheep. Moreover, although eggs are an important and highly beneficial article of food, they can be dispensed with to a considerable extent in time of scarcity, provided there is a sufficient supply of milk, cheese, meat, and green vegetables.

"The primary cause of the shortage of the imported cereals is lack of freight due to the heavy demands made on shipping for military purposes. The new situation has necessitated a further reduction in the amount of cereal feeding stuffs available for poultry, and was responsible for the statement by the Minister of Agriculture warning poultry-keepers that they might have to reduce their flocks to one-third by the autumn. It is regretted that a more encouraging reply cannot be given to you, but the difficulties and hardships of poultry-keepers are the inevitable consequences of the national emergency."

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£40,000 FOR FAMOUS RACEHORSE

The British Bloodstock Agency states that negotiations for the sale of the Aga Khan's famous racehorse and sire Bahram to a syndicate of breeders in Maryland, U.S.A., were completed on Thursday of last week. Bahram is to be shipped to America, and the price was £40,000, which was paid in American dollars. The negotiations had been held up for some time because of legal and currency difficulties. They were concluded after Bahram had been examined by Senator I. J. Parkinson, M.R.C.V.S., and Mr. J. J. Cosgrove, M.R.C.V.S., acting in their capacities as veterinary surgeons. Bahram won the Derby, the Two Thousand Guineas, and the St. Leger in 1935.

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DRIED BLOOD PLASMA

The advantages of dried blood plasma over the older methods of blood and serum storage were emphasised by the Minister of Health, Mr. Malcolm MacDonald, in a recent speech in London. A summary of his speech was reported in the B.B.C. news bulletins and in the national Press.

Part of the work on dried plasma has been carried out at the University of Liverpool, and the results described in *The British Medical Journal* for March 9th, 1940. Stored whole blood is only suitable for transfusion within about four weeks of withdrawal from the donor. Blood plasma, however, keeps indefinitely, and it is the plasma which produces the desired therapeutic effect; the red cells play only a secondary part in transfusion. On account of its volume the storage and transport of plasma involves difficulty; dried serum can be conveniently carried in a test tube, and the plasma is reconstituted as required.

The plasma is dried under aseptic conditions at 37° C. under reduced pressure. From 1 pint of citrated blood, the form in which blood is normally stored in blood banks, from 250 to 300 mils of plasma is obtained, and each 100 mils of plasma yields approximately 8 gm. of the dried product. This is a pale yellow crystalline powder, which dissolves readily in warm water. The preparation of the plasma for administration is carried out by dissolving 20 gm. of the powder in 500 mils of 5 per cent. dextrose solution.

The ideal plasma contains no agglutinin, and is obtained from Group AB (I) blood group. Only 3 per cent. of the population, however, belong to this group, but plasma free from agglutinins can be prepared artificially by mixing specimens taken from groups A (II) and B (III); under these conditions the a agglutinin of the group B (III) plasma is absorbed on group A (II) red blood corpuscles, and the β agglutinin of the group A (II) plasma on the group B (III) corpuscles. Group O (IV) blood, which is generally used in the blood bank system, and which contains both a and β agglutinins, can safely be given to most patients in quantities up to 500 mils; the agglutinins are either diluted by the recipient's serum or quickly absorbed by the first few red cells with which they come in contact, so that no serious agglutination occurs.

Thus it appears that plasma from all four blood groups can now be utilised in blood transfusion, and blood supplies need no longer be obtained from universal donors, or, alternatively, the four types of blood maintained in stock to meet all emergencies.—*Pharm. J.*

* * * * *

MINISTRY OF AGRICULTURE NEWS SERVICE

Save Straw as well as Grain: Short Stubbles must be the aim this Harvest.—Cereal straw has a lower feeding value than hay, but it is not to be despised, especially by those who have to carry store cattle through the winter. In the severe winter of 1939-40 many farmers had to fall back on straw instead of hay for their stores. The first aim should be to get the grain harvested in best condition, but the more straw that can be got with it the better. A short stubble wherever possible should be the aim. It is not suggested that farmers should deliberately lay up trouble by cutting and tying-up in the sheaf a lot of greenstuff, nor that straw has a high feeding value, especially the lower portions of the stems, which are the least nutritious parts; but it is a useful roughage, especially for stock not in high production, and will serve to eke out the hay this winter. Much grassland has been ploughed and some of the straw grown on it will have to supplement hay. Along with roots this is quite possible. A suitable basis for calculation, for instance with oat straw, would be: 2 lb. oat straw and 1 lb. kale = 1 lb. hay.

In Scotland and the North of England oat straw is commonly fed, the crop being cut before it is completely ripe and before the transfer of goodness from leaf and stem to grain has been completed. Such straw constitutes a valuable roughage, but even straw from an ordinary crop of oats, cut when fully ripe, is useful roughage. Barley straw, on the other hand, is looked on by many as poor feed for cattle. The actual straw itself has only a low feeding value as the crop is usually harvested when fully ripe, but barley is frequently undersown with "seeds" or clovers and when these take well a fair proportion of the young "seeds" leaf is cut by the binder and included in the sheaf. From the standpoint of getting the sheaves fit to cart this greenstuff is sometimes a nuisance, but it does increase the feeding value of the cavings and straw. The feeding value when there is

much of this greenstuff present is generally given as slightly higher than oat straw. Wheat straw has only a low feeding value, but when harvested with some greenery and fed long, as it should be whenever possible, cattle will pick it over and select the best and most palatable parts, and tread the rest down as litter.

Late Rape for Winter Feed; Valuable Crop for Rapid Fattening.—Rape is an adaptable crop that withstands winter and can be sown late. It will grow on a wide range of soils, from rich loams and fens to chalks and even heavy clays, but prefers a soil well supplied with lime. It can be sown after early potatoes or early-harvested cereals, either by itself or with stubble turnips. Alternatively it can be drilled in rows where mangolds or swedes have failed. Sown in July or early August, a high protein feed is ready for use in October and November. A mixture of rape and ryegrass is also frequently grown as a catch crop after early potatoes to produce helpful winter keep.

The seed is usually broadcast at 6 lb. per acre, or it may be drilled at the rate of 3 lb. Stubbles that are to receive the crop should first be broken up with a cultivator or disc harrow. After-cultivations are unnecessary.

Rape is one of the best sheep feeds available, and is particularly valuable where rapid fattening is desired. Sheep fattened on rape have a reputation for killing out well. It is also excellent for flushing ewes, and a short daily run on rape before putting out the rams, and while they are still with the ewes, generally results in a higher percentage of lambs and a shorter lambing period.

If not too severely grazed, it comes away well and gives a useful bite for ewes in the early spring. Care should be taken to avoid "hoven" or "blowing" in the stock fed on rape. They should not be turned on to fresh rape on empty stomachs.

Big Demand for Silos.—An instance of the readiness with which farmers are adapting their methods to war-time conditions is furnished by a well-known firm of silo makers. Between 9 a.m. and noon on July 25th they had received 150 orders for silos. This is easily a record and demonstrates that farmers are taking the Government's advice to overcome the shortage of imported winter feeding stuffs by storing home-grown supplies in the form of ensilage. A few months ago, ensiling was a process almost unknown to many thousands of farmers now adopting it.

Molasses for Silage.—From now on merchants will be allowed to deliver two barrels (40 gallons each) of molasses to farmers without production of a War Agricultural Executive Committee permit, instead of one barrel only as heretofore.

* * * * *

EDIBLE AND POISONOUS FUNGI

In these days special importance attaches to all food sources, and the Ministry of Agriculture has issued a new edition of its 2s. 6d. Bulletin, "Edible and Poisonous Fungi," as a reliable guide. There are 25 coloured plates that speak for themselves, and a short note with each giving particulars of the variety. Since some of the descriptive terms are rather technical, a short glossary has been included at the end.

There are comparatively few of our many varieties of fungi that are really poisonous, although there are more that are very indigestible. There are others that only cause unpleasant symptoms if eaten under certain conditions, such as the Morels, that may cause illness if eaten raw, or the Ink Cap, that may be treacherous if eaten with alcoholic drinks. But there is a much wider range than the Common and Horse Mushrooms, together with the more rare Blewits, that are perfectly safe if eaten prudently in proper condition.

Sir Arthur Hill, Director of Kew Gardens, has written an illuminatiing introduction. Copies are obtainable from H.M. Stationery Office or through any bookseller.

Swine fever is gradually being eliminated from Aberdeenshire, but no authority has yet been given for the selling at auction marts in the county of young, store and breeding pigs.

* * * * *

The maximum recorded milk yield for a goat in England in 1938 was 5,080 lb. The average annual milk yield for 133 full-year goats was 2,260 lb.

CORRESPONDENCE

Letters to the Editor should reach the Office not later than by the first post on Tuesday morning for insertion in following Saturday's issue.

The views expressed in letters addressed to the Editor represent the personal view of the writer only and must not be taken as expressing the opinion or having received the approval of the N.V.M.A.

* * * * *

CONTAGIOUS KERATITIS IN CATTLE

To the Editor of the Veterinary Record

Sir,—The article "Contagious Keratitis in Cattle" by Messrs. J. F. Craig and A. Ratter in your issue of June 8th, 1940, prompts me to send an account of my experience with this disease, or one similar to it.

It was about twenty years ago that I came across my first cases. A client rang up to say that in two or three days he had lost four oxen which had fallen over a cliff and broken their necks, and apparently the animals had gone blind suddenly. He had 15 blind beasts in the yard at that time and asked me to see them.

I found them in capital condition and that their appetites were good. The owner said that the animals appeared to be all right in the morning before they went to the pasture to graze and within a few hours their eyes became affected. The condition was common to both eyes. There was a watery discharge—in a few cases the discharge was slightly purulent—redness of the conjunctiva, and the colour of the cornea varied according to the length of time an animal had been affected. In most cases it was chalky white, but the animals seemed to have gone blind before the onset of opacity of the cornea. While looking over those, the rest of the herd (about 45) came in from the pasture, and in about 30 of that number corneal opacity was seen: they were quite blind. The following morning all were blind.

That same day the manager of another plantation, about three miles away from the first, telephoned to say that he had six blind cattle in his herd. Neither the animals nor the attendants of the herd first attacked came in contact with this herd. Later in the day several more in this herd became affected, and by the following morning all the animals—about 70—in this herd were blind. A day or two later another herd, 15 miles away from the first two, became affected.

The disease spread from place to place, and so rapidly, that within about ten days every bovine in this island was affected. The condition involved thousands of animals and was confined to cattle—of all ages and both sexes. Your readers will realise how unenviable was my position: I am the only veterinarian here, was young at the time, and had read of nothing of a similar nature—my notes taken at college made no reference to any such condition, and Freidberger and Fröhner's pathology had no description of anything like this, except malignant catarrhal fever; the symptoms described for that disease (rigors, fever, etc.) were absent, however. Moreover, the affection was beyond the experience both of everyone whose residence had been confined to the island and of those who had lived abroad, even though they had travelled all through the Caribbean islands.

Treatment.—I had to admit my ignorance of the condition and as an experiment prescribed iodide of potassium, ½-dr. doses in water *b.i.d.* internally for a week—

for six animals, as it would have taken more than the total quantity of that drug in this island if I had prescribed for all, and the cost would have been enormous. The KI was prescribed as an alterative and absorbent. For the eyes I prescribed argentum nitrate in 1 per cent. solution; a few drops to be instilled into the eyes *b.i.d.*

The symptoms gradually subsided and in ten to fourteen days the majority of the animals were normal. In only one case, to my knowledge, was the intra-ocular pressure so great as to rupture the cornea, and leave the animal permanently blind in that eye.

Since that outbreak I have met with only a few cases here and there every year. I have not observed that this disease affects animals at any particular season, but I have not been careful in keeping records. Only last week one of the managers, having two animals affected, asked me to "prescribe for the eye trouble in cattle."

A few years ago one of the managers complained that the eye drops did not seem to be doing much good and I changed from argent. nit. to argyrol 2 per cent. solution. He reported this to be more beneficial and I have continued with it in consequence.

Ernest F. Jardine, B.V.Sc.,
Government Veterinary Surgeon.

Box 34,
St. Kitts, B.W.I.

July 3rd, 1940.

* * * * *

SALVAGE OF CATTLE CARCASES

To the Editor of the Veterinary Record

Sir,—In reference to the query of Mr. H. C. Swann in your issue of August 17th, although personally I am not conversant with the related A.R.P. regulations, nevertheless the handling of lairage cattle and meat in different meat works in cattle-raising countries has been my experience for many years. I therefore propose briefly to state the procedure at such centres, as this may be of some use to Mr. Swann when dealing with injured animals.

When an injured animal arrives at the abattoir either on foot or by lorry or railway waggon, whether injured by shell, toreador, railway engine, lorry or by a fall over a precipice, etc., and an opportunity occurs for utilising the meat of such animal for human consumption, the usual routine is firstly to spray the whole body with abundance of cold water for several minutes, prior to slaughtering. The sooner such an animal is slaughtered, the greater are the chances in favour of the meat being fit for human consumption. From a humanitarian point of view, a severely injured animal on a farm should be slaughtered on the spot, unless a slaughterhouse is available within a reasonably short distance. Very often on a farm the accommodation is poor for dressing and for retaining the carcase clean. The animal in such case should be bled on the farm and the carcase should be left intact until it reaches the slaughterhouse with the exception of a longitudinal incision made through the skin and flesh behind the sternum, sufficiently large to allow the outside air to enter the abdominal cavity; by this means the internal organs are retained in a better state than in the absence of air. Needless to mention, it should arrive at the slaughterhouse before the animal heat disappears from the carcase. Again, when the carcase is dressed, it should be split into two sides so as to allow the air to circulate more easily around the meat, and also suspended in a well-ventilated building six to twelve hours to set, otherwise the meat will be blood-stained and clammy and decomposition sets in rapidly.

In the packing houses of most of the American Republics where the range cattle are nervous and wild, it has been found advisable to allow them to remain under a cold shower before entering the killing pen. This helps to calm the animals and to lower the body temperature, and in the avoidance of highly coloured meat, generally termed fevered meat. Apart from those which are injured, animals are allowed from 12 to 24 hours in the yards to rest, with a supply of drinking water *ad libitum*, prior to slaughter. Naturally when meat on a large scale is either chilled or frozen, careful study is always made of such details, otherwise the meat when thawed gives unsatisfactory results.

Yours faithfully,

Edward Morgan.

"De Lejos,"
Crest Road,
Hayes, Kent.

August 19th, 1940.

DISEASES OF ANIMALS ACTS, 1894 TO 1937, AND AGRICULTURE ACT OF 1937 (PART IV)

Summary of Returns of Confirmed Outbreaks of Scheduled (Notifiable) Diseases

Period.	Anthrax.		Foot-and-Mouth Disease.		Parasitic§ Mange.		Sheep Scab.	Swine Fever.	
	Outbreaks confirmed.	Animals attacked.	Outbreaks confirmed.	Animals slaughtered as diseased or exposed to infection.	Outbreaks confirmed.	Animals attacked.	Outbreaks confirmed.	Outbreaks confirmed.	Swine slaughtered.
	No.	No.	No.	No.	No.	No.	No.	No.	No.
Period 1st to 15th July, 1940	15	18	—	—	1	2	2	221	165
Corresponding period in ...									
1939	29	30	—	—	—	—	4	149	138
1938	30	33	—	—	—	—	1	36	32
1937	20	42	3	2,575	1	1	3	42	15
Total 1st January to 15th July 1940	296	334	19	2,850	15	30	117	2,333	1,431
Corresponding period in									
1939	481	521	44	5,652	31	70	156	1,200	832
1938	511	566	155	19,940	42	70	104	336	248
1937	431	514	9	3,246	86	123	130	662	411

Note.—The figures for the current year are approximate only. § Excluding outbreaks in Army Horses.

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Factors in Canine Nutrition

[No. 35]

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